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Current Position

Since 12/2015 Professorship for chemical technology (permanent, W3), Chemistry Department, Technische Universität Darmstadt

Previous Positions

04/2015-11/2015 Professorship for Catalytic Materials (permanent, W2), Chemical- and Biological Engineering Department of Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

05/2014 Offer for a full professorship for Chemical Engineering at an excellent UK university (Russell international excellence group).

01/2010-03/2015 Juniorprofessor for Catalytic Materials (tenure track, W1) assistant professorship (Juniorprofessur) within the Chemical- and Biological Engineering Department of the FAU

01/2011-06/2011 Drexel University, Feodor-Lynen Research Fellow (Alexander von Humboldt-Foundation), Materials Science and Engineering, Philadelphia

04/2008 - 12/2009 Postdoctoral fellow, Cluster of Excellence "Engineering of Advanced Materials", FAU

11/2004 - 03/2008 PhD, research assistant, University of Bayreuth, Chemical Engineering, Bayreuth

Education

- 2007 **Dr.-Ing. (Ph.D.) in Chemical Engineering**
University of Bayreuth, Germany
Thesis: "Epimerisation of the Menthol stereoisomers:
kinetic studies for the heterogeneously catalysed
menthol synthesis" (summa cum laude)
Advisor: Prof. A. Jess
- 2004 **Dipl.-Ing. (M.Sc.) in Chemical Engineering**
University of Erlangen-Nürnberg, Germany
Thesis: "Coating of carbon short fibres via chemical vapour deposition (CVD)"
Advisor: Prof. N. Popovska
- 2008 **Dipl.-Kfm. (M.Sc.) in Economics**
University of Hagen
Thesis: "Organizational intelligence - a critical analysis"
Advisor: Prof. J. Weibler

Awards and Distinctions

- 2023 Awarded with a Bavarian Distinguished Professorship (Bayerische Spitzenprofessur)
- 2022 Visiting Professor at the University Toulouse III - Paul Sabatier (Host Prof. Serp)
- 04/2016 Awarded by the ERC with a Consolidator Grant
- 04/2014 Awarded by the Chinese-German Center for Promotion of Science (CDZ) with a scholarship to support cooperation of excellent young German scientist with Chinese colleges
- 03/2012 Awarded by an Erasmus Mundus Scholarship as a visiting lecturer for the international Master Course 'Materials for Energy Storage and Conversion' (MESOC)
- 01/2011 Awarded by the Feodor Lynen Research Fellowship from the Alexander von Humboldt-Foundation
- 11/2011 Awarded by the Griess Lecture award 2011 of the Royal Society of Chemistry East Midlands Section
- 01/2010 Awarded by a tenure track position within the Rising Star program of the cluster of excellence „Engineering of Advanced Materials“ of the University of Erlangen-Nürnberg
- 08/2009 Awarded by the Travel Award of the 1st Nano Today Conference 2009 in Singapore
- 06/2009 Awarded by the ProcessNet "Fachgemeinschaft Chemische Reaktionstechnik" with the Hanns Hofmann price
- 05/2009 Awarded by the Honda German Initiation Grant 2009
- 04/2009 Awarded by the E.ON. Research Initiative 2008

Service to the Scientific Community

since 2023	Member of the selection committee for Alexander von Humboldt Foundation research scholarships
since 2019	Member of the editorial board of the ASEAN Journal of Chemical Engineering
since 2018	Member of the steering group (Lenkungskreis) of the German Catalysis Society (GeCatS)
since 2017	Board member of the ProcessNet section division 'reaction engineering'
since 2017	Vice president of the German carbon group (Arbeitskreis Kohlenstoff)
2022-2023	Speaker xchange-cluster H2 of TU Darmstadt
2021-2023	Elected Member of TU Darmstadt's University Assembly
2019-2023	Vice-Dean of the Chemistry Department at the TU Darmstadt
2018	Organisation of the 2 nd joined German-Chinese Symposium "Development and Technology of Carbon Materials", Shenzhen, China
2016	Co-organisation of the Carbocat CarboCat-VII Symposium, Strasbourg, France
2014	Organisation of the Summer School in Chemical Reaction Engineering, Aachen, Germany
2013-2015	Member of the council of the school of engineering (Technische Fakultät), FAU Erlangen-Nürnberg, Germany
2012-2016	Coordinator of the international EU-FP7 project SusFuelCat
2011-2013	Founding and board member of the young chemical reaction engineering section (Nachwuchsgruppe Reaktionstechnik), ProcessNet, Germany

Research statement

In my research the challenges arising with the needed global energy change and future sustainable feedstock supply for chemical industry and especially electrochemical processes are the major research guideline. From the perspective of chemical reaction engineering, a multidisciplinary approach is employed to provide scientific solutions for these challenges, especially for the complex interplay of reaction and transport and how the interplay is influenced by materials and process conditions. In the scientific approach experiments from controlling process conditions from highly idealized towards technically realistic play a dominant role. Thereby, synergies are leveraged between experimental design and the competence in synthesis of defined materials (electrodes and catalysts). Chemical reaction engineering simulations complement the experiments, giving insights into complex mass transfer phenomena. Flow sheeting simulation covering a full process allow to gain a holistic view and to assess environmental and economic impact of the improvements achieved e.g. on catalyst level.

Processes studied focus on Power-to-X technologies and are for electrochemical processes alkaline water electrolysis, CO₂ electrolysis, electrosynthesis, and PEM fuel cells. Direct air capture and methanol synthesis complete the process chain. In electrochemistry additional to aqueous electrolytes also ionic liquids are intensively employed e.g. through the Solid Catalyst with Liquid Layer (SCILL) concept. The material competence and research focus especially on carbons, which are widely applied in electrochemistry due to their superior properties. These are controlled in morphology from the nano- to the macroscale, e.g. through 3D printing approaches, and in surface chemistry and crystallinity.